

REMARKS

(1) Claims 21, 22 and 24-35 are pending in this application, of which claims 33-35 have been added.

(2) Claim 32 is rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement.

The specification at page 19, lines 1-19 and Fig. 2C describes that the printed bias 18a, high dielectric layer 20a, stress mitigating layer 22a and the base dielectric layer 24 are formed on the resin film 30 as one embodiment. The specification further describes as follows:

In the above-described embodiment, one stress mitigating layer is formed between the high dielectric layer and the base dielectric layer, but one layer is not essential. A plurality of the stress mitigating layers may be formed, and in this case, preferably the material compositions of a plurality of the stress mitigating layers are graded. That is, it is preferable that a plurality of the stress mitigating layers have material compositions which are nearer to a composition of the high dielectric layer as the layers are nearer to the high dielectric layer and are nearer to a composition of the base dielectric layer as the layers are nearer to the base dielectric layer.

Page 25, lines 4-16 of the specification. A person having ordinary skill in the art recognizes that the description in the specification teaches forming another stress mitigating layer between the high dielectric layer 20a and the base dielectric layer 24. Thus, the limitation of claim 32 is supported by the original disclosure of the invention. Reconsideration of the rejection is respectfully requested.

(3) Claims 21, 22, 24-27 and 29-31 were rejected under 35 U.S.C. §103(a) as being unpatentable over Otsuki in view of Miyazaki and Ushikoshi.

(i) “[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR International Co., v. Teleflex Inc.*, 127 S.Ct. 1727, 1241 (2007). “[T]here must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR*, at 1741, citing *In re Kahn*, 441 F.3d 977, 988 (C.A.Fed. 2006). *KSR* states a claim can be proved obvious merely by showing that the combination of elements was “obvious to try,” “[w]hen there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp.” *KSR*, at 1742.

(ii) In response to the Applicant’s argument that Otsuki’s process cannot be replaced with Miyazaki’s screen-printing method, the Examiner states that that:

“It is not suggested that the process of Otsuki could be switched to screen-printing *without any other changes being made*. However, since both screen-printing and ink or bubble jet printing are known methods of creating a substrate with a high degree of control over the layers, one of ordinary skill in the art would be able to modify the method of Otsuki, to develop a screen-printing method where the building of the layers was substantially similar to that of Otsuki, thus rendering the current invention obvious.”

Page 9 of the Office Action. Emphasis is added. The Applicants disagree with the Examiner. As *KSR* states, even if screen-printing and ink or bubble jet printing are known methods as creating a substrate, the claim composed of elements known in the prior art is not proved obvious merely by demonstrating that each of elements was, independently, known in the prior art. *KSR*, 127 S.Ct. 1241. The proper inquiry here should be whether the Examiner articulates reasoning with some rational underpinning to support the legal conclusion of obviousness. *KSR*, at 1741. The Examiner states that the Otsuki's ink or bubble jet printing can be replaced with Miyazaki's screen printing method *with making changes*. However, the Examiner did not articulate any reason why one skilled in the art would change Otsuki as the Examiner proposes. For example, the Applicants previously argued that Otsuki teaches sintering the first basis layer before forming the second basic layer, whereas Miyazaki's screen printing cannot be sintered to form each ceramic green sheet. The Examiner does not even identify what changes are necessary to replace the Otsuki process with Miyazaki's screen printing, nor show that such changes are obvious changes to the one skilled in the art. The change as the Examiner proposes is not obvious to the one skilled in the art at the time the invention was made. No prior art teaches or suggests merits to so replace. No prior art explicitly or implicitly teaches or suggests a motivation to modify as the Examiner proposes. Without showing such an articulate reasoning, the analysis is hindsight. The Examiner merely states that the Miyazaki's screen-printing makes the building of the layers substantially similar to that of the Otsuki's ink or bubble jet printing (page 9, lines 7-9 of the Office Action), rendering the invention obvious. That the Miyazaki's screen-printing makes the

substantially similar layers to that of the Otsuki's ink or bubble jet printing *per se* will not a motivation to modify. Making substantially similar layers does not mean using substantially similar processes. Moreover, if the modification makes merely a substantially similar structure, one skill in the art is not motivated to modify it. One skilled in the art is not motivated to modify the prior art unless some merits are expected. The modification of Otsuki in view of Miyazaki as proposed by the Examiner is not supported by the any articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. See *KSR*, at 1741.

The Examiner states that screen-printing and ink or bubble jet printing are known methods of creating a similar structure in view of building layers (page 9, lines 1-9 of the Office Action); or that Miyazaki's "screen printing is an effective means for depositing regions of conducting an insulating materials (page 3, lines 15-20 of the Office Action). However, Miyazaki teaches a lamination method of ceramic green sheet. What is *an effective means* to form conducting and insulating materials taught by Miyazaki is obtained by laminating ceramic green sheets. It is not a technical grasp of one skill in the art at the time the invention was made to replace the Otsuki's ink or bubble jet printing with the Miyazaki's screen printing method without using Miyazaki's lamination process. The teaching by Miyazaki is to use screen printing to form a ceramic green sheet for lamination. The prior art teaching does not extend to adding any changes in order to change ink or bubble jet printing into screen printing. If the Examiner considers that one skill in the art can modify the references whatever it needs, the conclusion of

obviousness is not supported by any articulated reason as stated by *KSR*. The Examiner states that “It is not suggested that the process of Otsuki could be switched to screen-printing *without any other changes being made.*” Page 9, lines 2-3. Neither Otsuki nor Miyazaki, explicitly or implicitly, teaches any motivation to support the modification as the Examiner proposes.

Rather, Miyazaki discloses both in “Background Art” and “Detailed Description of Preferred Embodiment” that screen-printing is used to form each ceramic green sheet, and then, a plurality of ceramic green sheet are laminated. *See* paragraphs [0004]-[0009] and [0060]-[0064]. Miyazaki’s teaching, at most, is that the screen printing is an *effective means* to form a substrate when forming each ceramic green sheet separately, and then, laminating a plurality of ceramic green sheets. If removing the steps of forming distinct ceramic green sheet for laminating it, the invention by Miyazaki is made inoperable. The proposed modification of the prior art make the invention of the prior art inoperable. If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984). Also, *see* MPEP 2143.01.

The Examiner merely combines distinct and independent teachings without showing a motivation to combine or motivation to modify. As stated in *Innogenetics, N.V., v. Abbott Laboratories*, 512 F.3d, 1363, 1373, 1374 (Fed. Cir. 2008), a post *KSR* decision, mere listing of

prior art reference, without offering evidence of a “motivation to combine” does not establish the *prima facie* case of obviousness.

(iii) The Examiner considers that the “stress mitigating layer” disclosed at column 9, lines 4-5 by Ushikoshi corresponds to the present invention simply because of merely finding the same term in Ushikoshi. However, Ushikoshi only discloses a ceramic heater having a resistive heating element of a metal material inserted in aluminum nitride, which is completely different from ceramic substrates including a passive element. In Ushikoshi, the ceramic material is limited to aluminum nitride, so it is essential to use hot pressing at high temperature of 1900°C (col. 7, lines 20-21). Ushikoshi shows several metal materials inserted in aluminum nitride, indicating that a coefficient of thermal expansion larger than that of aluminum nitride and a high melting point is of significant factor for the ceramic heater. Ushikoshi merely teaches that molybdenum is better as a resistive heating element while tungsten is normally used.

Ushikoshi just focuses on the problem in the ceramic heater as to the mismatch of coefficient of thermal expansions between the aluminum nitride substrate and the metal material inserted therein. Ushikoshi teaches that that durability against the heat cycles is conspicuously improved in the laminated structure of heat generator body composed of molybdenum, a molybdenum oxide layer and a molybdenum carbide layer. This phenomenon is peculiar to using aluminum nitride.

Since simple aluminum nitride cannot be sintered, yttria (yttrium oxide) is added as a sintering aid into aluminum nitride. It is known that powder of aluminum nitride containing no oxygen cannot be prepared, so yttria reacts with aluminum nitride and oxygen therein upon sintering to form a material having a garnet structure of $YAlO_x$. This is a technique to remove oxygen from aluminum nitride as a reaction product during sintering. In Ushikoshi, molybdenum oxide is formed at the interface between aluminum nitride and molybdenum carbide. Molybdenum oxide is considered to serve as a "stress-mitigating layer." Aluminum nitride is indispensable for forming molybdenum oxide, and thus Ushikoshi only teaches utilizing aluminum nitride in such a restricted manner.

In addition, the present invention solves the problems associated with generation of cracks and inter-layer release caused by stresses due to the shrinkage rate difference between different materials (page 18, lines 22-25 in the specification). On the contrary, Ushikoshi intends to prevent occurrence or propagation of cracks caused by stresses due to the difference of coefficients of thermal expansion between different materials. The origins of the stresses to be mitigated are different between the present invention and Ushikoshi. The means to solve the problems taught by Ushikoshi et al. does not simply apply to Otsuki or Miyazaki. Ushikoshi merely teaches the technique peculiar to using aluminum nitride. On the other hand, Miyazaki discloses that a ceramic paste is applied onto a base ceramic green sheet to form a ceramic green

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layer for compensating spaces defined by step-like sections due to conductive layers forming internal circuit elements. In Miyazaki, ceramic powder contained in ceramic slurry for forming the ceramic green sheet has a composition substantially the same as that of the ceramic powder contained in a ceramic paste for forming the ceramic green layer. Miyazaki never teaches or suggests any clue to perform screen-printing of a dielectric material between the different regions on the same basic layer where the different dielectric materials are screen-printed. Thus, one skilled in the art is not be motivated to modify the combination of Otsuki with Miyazaki further in view of Ushikoshi.

(4) Claim 28 is rejected under 35 U.S.C. §103(a) as being unpatentable over Otsuki, Miyazaki and *Otsuki* in view of Yamana.

It is unclear which Otsuki references the Examiner relies on. Claim 28 depends on claims 21, 25 and 27. Otsuki (US Publication 2006/0165875) is relied on the rejection on claims 21, 25 and 27. There is no record of the second “Otsuki” reference.

Assuming that the second “Otsuki” should read as “Ushikoshi,” the Applicants argue as follows: The same arguments as explained in Section (3) apply to this rejection. Reconsideration of the rejection is respectfully requested.

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In a case where the rejection is maintained, the Applicants respectfully request a non-final rejection. The Applicants should be given full opportunities to rebut the Examiner's position based on the full understanding of the position.

(5) Newly added claims 33-35 are supported at page 14, line 22 to page 17, line 26. The features of claims 33-35 are not taught by the cited references. Thus, claims 33-35 are not obvious over the references.

(6) In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date. If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned representative at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

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If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,
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Petition for Extension of Time